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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/930,557	08/15/2001	Jeffrey A. Colborn	04813.0016.NPUS00	9887

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EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 10/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/930,557

Applicant(s)

COLBORN, JEFFREY A.

Examiner

Jonathan S. Crepeau

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) 46-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33, 36-40 and 42-45 is/are rejected.
- 7) ☒ Claim(s) 34, 35 and 41 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-45 in Paper No. 9 is acknowledged. Claims 46-49 are now withdrawn as being drawn to nonelected invention.

Claim Suggestions

2. The clarity of claim 41 could be improved by changing the term “and/or” in line 3 to “and”. This is because the claim makes clear that it is both the fuel cell *and* the load that are being sufficiently cooled, not the fuel cell *or* the load (i.e., one or the other). Correction is suggested, but not required.

Claim Objections

3. Claims 31, 35, 37, 38, and 42 are objected to because of the following informalities: in claim 31, “the second reactant storage unit” lacks proper antecedent basis; in claim 35, a period should be inserted at the end of the claim; in claim 37, “the means for physically supporting the one or more fuel cells and at least one of the one or more loads” lacks proper antecedent basis; in claim 38, “the means” lacks proper antecedent basis; in claim 42, the preamble “The method of claim 1” is improper because claim 1 is directed to a system. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-8, 13-26, 30, 32, 39, 40, and 42-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapiro (U.S. Patent 6,067,482) in view of Colborn et al. (U.S. Patent 5,952,117).

Regarding claims 1 and 40, Shapiro is directed to a fuel cell system comprising a fuel cell (82) (see Fig. 3; col. 7, line 38-41). The fuel cell provides backup power to a load (68, 70) and a cooling unit (e.g., compressor 24) upon the occurrence of a power outage condition (see Fig. 1; col. 3, line 20; col. 6, lines 18-42). Regarding claims 13-15, 43, and 44, the system comprises a controller (22) for monitoring the power supplied to the load and connecting and disconnecting the fuel cell in response thereto (see Fig. 1; col. 6, line 55 et seq.). Regarding claims 32, 39, and 42, the load may comprise an evaporator (see col. 6, line 35), which is cooled by the coolant to be evaporated entering therein.

Shapiro does not expressly teach that the fuel cell comprises a fuel storage unit, as recited in claim 1. The reference further does not teach that the fuel cell is a zinc fuel cell (claims 2-6 and 45), or that the fuel cell comprises a regeneration unit (claims 6 and 7) or a reaction product storage unit (claim 8). The reference further does not teach that the system is configured to expel

substantially no reaction products outside the system (claim 30) or that the fuel cell has a cavity for storing fuel (claims 24-26).

Colborn et al. is directed to a method and an apparatus for refueling an electrochemical power source. The power source comprises a zinc/air battery (see col. 5, line 5). The apparatus further comprises a regeneration unit, a fuel storage unit, and a reaction product storage unit (see Figure 1). The system is configured to expel substantially no reaction products outside the system (see Figure 1). In column 6, line 61 and in Figure 2, the reference teaches cavities (42) for storing fuel within the fuel cell.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the fuel cell system of Colborn et al. in the system of Shapiro. In column 4, line 58, Colborn et al. teach that “[a]dvantageous characteristics of this interface include promotion of reliable feeding of spent electrolyte from the transportable containers into the refilling apparatus, promotion of reliable feeding of fuel particles from the refilling apparatus into the transportable containers, promotion of reliable feeding of fresh electrolyte from the refilling apparatus into the transportable containers, minimization of exposure of the user to electrolyte at all times, especially during refilling of the transportable containers, promotion of easy and rapid refilling of transportable containers, efficient utilization of space, simplicity, durability, and low manufacturing cost.” Accordingly, the artisan would be motivated to use the fuel cell system of Colborn et al. in the system of Shapiro.

Regarding claim 16, the system of Colborn would inherently not utilize or produce significant quantities of flammable fuel or reaction product.

Regarding claims 17 and 18, the system of Shapiro is inherently capable of providing backup power within the claimed time periods.

Regarding the ranges of energy density and volume of fuel and electrolyte added per watt-hour of the system's energy requirement recited in claims 19-22, these ranges are not considered to distinguish over the references. These ranges represent an absolute size of the system and fuel cell of Shapiro. The courts have generally held that changes in size are not sufficient to patentably distinguish a claim over the prior art. See MPEP §2144.04 (IV)(A).

Regarding the range of pressure of the fuel tank recited in claim 23 (-5 psi to 200 psi), this range is not considered to distinguish over the references. Absent any disclosure of pressurization by Colborn, it would be obvious to store the fuel of Colborn at atmospheric pressure (14.7 psia or 0 psig). Accordingly, as both these values fall within Applicant's claimed range, the range is not considered to distinguish over the reference.

6. Claims 9, 27-29, 31, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapiro in view of Colborn et al. as applied to claims 1-8, 13-26, 30, 32, 39, 40, and 42-45 above, and further in view of Kohlstruck et al (U.S. Patent 6,011,324).

Neither Shapiro nor Colborn et al. expressly teach a second reactant storage tank for storing oxidant, as recited in the instant claims.

Kohlstruck et al. is directed to an uninterruptible power supply comprising a fuel cell (8), a fuel tank (9), and an oxygen tank (10) (see Figure 1).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the oxidant storage tank of Kohlstruck et al. in the modified system of Shapiro. In column 2, line 50, Kohlstruck et al. teach that “[i]n connection with a practical embodiment, hydrogen and oxygen is supplied to the fuel cell from pressurized containers, wherein the supply is throttled during standby operations and is strong during operation at normal rating by means of opened valves. Since during standby operation the reactant usage is relatively small, the gas supplies last very long if no network interruption occurs. The oxygen in particular is contained in the air which is stored in a compressed air reservoir. It is therefore not necessary to operate the fuel cell with pure oxygen. Compressed air is available at reasonable cost. It can also be generated by a compressor.” Accordingly, this disclosure would motivate the artisan to use the oxidant storage tank of Kohlstruck et al. in the modified system of Shapiro.

Furthermore, Kohlstruck’s disclosure of “compressed air” in a “pressurized container” is sufficient to render obvious the range in claim 27 that the oxidant is present in the power source at a pressure of 0.01 psig to about 200 psig before operative engagement of the power source. Regarding claims 28 and 29, it would be obvious to keep oxidant in the fuel cell at a time prior to the power outage so as to be able to quickly generate power upon occurrence of a power outage. Accordingly, these claims are also not considered to distinguish over the references.

Regarding the ranges of reactant storage unit volume recited in claim 31, these ranges are also not considered to distinguish over the references. These ranges represent an absolute size of the modified fuel cell of Shapiro. As noted above, the courts have generally held that changes in

size are not sufficient to patentably distinguish a claim over the prior art. See MPEP §2144.04 (IV)(A).

7. Claims 10-12 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapiro in view of Colborn et al. in view of Kohlstruck et al. as applied to claims 9, 27-29, 31, and 33 above, and further in view of Frank et al (U.S. Pre-Grant Publication No. 2002/0114983).

Shapiro does not expressly teach that the system comprises a power conditioning system including DC/DC and DC/AC converters, as recited in claims 10-12 and 37, or that the fuel cell and the loads are physically supported by a means such as a rack (claims 36-38).

In the abstract, Frank et al. teach a portable fuel cell electric generator suitable for use as an uninterruptible power supply. The generator comprises DC/DC and DC/AC converters (see abstract). The generator further comprises a chassis (i.e., rack) (130) that supports the fuel cell and various loads associated with the fuel cell operation (see paragraphs 26 and 31).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the DC/DC and DC/AC power converters of Frank et al. in the system of Shapiro. In paragraph 32, Frank et al. teach that “to provide a high-quality AC power output at the output receptacle, the power conditioning system 160 includes a DC-DC converter, a DC-AC inverter, battery charge circuitry, load transfer circuitry and a microprocessor based control system. Such systems are well known in the art.” Accordingly, this disclosure would motivate the artisan to use DC/DC and DC/AC converters in the system of Shapiro.

Further, the artisan would be motivated to use the chassis (rack) of Frank et al. to support the fuel cell of Shapiro and its associated operational loads. In paragraph 26, Frank et al. teach that “[t]he UPS 100 can therefore be easily moved from one location to another.” Accordingly, this disclosure would motivate the artisan to use the chassis (rack) of Frank et al. to support the fuel cell of Shapiro and its associated operational loads.

Allowable Subject Matter

8. Claims 34, 35, and 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

Claims 34 and 35 recite, among other features, that a second cooling fluid cools a first cooling fluid, and then the first cooling fluid is circulated past the fuel cell and/or the load. The closest prior art, Shapiro, does not teach or fairly suggest such a configuration. Accordingly, claims 34 and 35 contain allowable subject matter.

Claim 41 is directed to a method of providing backup power to a cooling unit and a load, which, among other steps, comprises the step of engaging the cooling unit to cool both the load and the fuel cell sufficiently to allow both to dissipate heat and to continue functioning. The closest prior art, Shapiro, also fails to teach or fairly suggest this configuration. Accordingly, claim 41 also contains allowable subject matter.

Conclusion

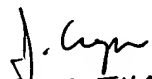
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (703) 308-4333. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 872-9310 (for non-final communications) or (703) 872-9311 (for after-final communications).

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

September 22, 2003


JONATHAN CREPEAU
PATENT EXAMINER
ART UNIT 1746